



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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<p><b>(21) International Application Number:</b> PCT/GB98/00469</p> <p><b>(22) International Filing Date:</b> 13 February 1998 (13.02.98)</p> <p><b>(30) Priority Data:</b>          9703000.1                      13 February 1997 (13.02.97)                      GB</p> <p><b>(71) Applicant (for all designated States except US):</b> SPANDEX PLC [GB/GB]; 1600 Park Avenue, Aztec West, Almondsbury, Bristol BS32 4UA (GB).</p> <p><b>(72) Inventor; and</b>  <b>(75) Inventor/Applicant (for US only):</b> DOBSON, Mary [GB/GB]; Spandex plc, 1600 Park Avenue, Aztec West, Almondsbury, Bristol BS32 4UA (GB).</p> <p><b>(74) Agents:</b> KIDDLE, Simon, J. et al.; Mewburn Ellis, York House, 23 Kingsway, London WC2B 6HP (GB).</p>		<p><b>(81) Designated States:</b> AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, GW, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).</p> <p><b>Published</b>  <i>With international search report.</i></p>
<p><b>(54) Title:</b> FIXINGS</p> <p><b>(57) Abstract</b></p> <p>A fixing (2) is provided for securing an object to a channel member (30) having a mouth restricted by inturned lips (36). The fixing has a head portion (4) having resilient arm (16), which is adapted so that in a first orientation it can be inserted through the mouth of the channel and force applied to cause the arms (16) to deflect against the channel, allowing the fixing to be rotated to a second orientation in which the arms are retained in the channel by the inturned lips (36). The fixing also has a shank portion (8) joined to the head portion. The shank portion is adapted to protrude from the channel (30). The fixing is particularly suited for mounting objects such as banners on surfaces for display. Also provided are kits comprising these fixings, a system for constructing a sign display using the fixings and methods of mounting objects using the fixings.</p> <div data-bbox="841 1218 1380 1953"> </div>		

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## Fixings

### Field of the Invention

5 The present invention relates to fixings, and in particular to fixings for mounting objects such as banners on surfaces for display. The present invention further relates to kits comprising these fixings, a system for constructing a sign display using the fixings and to methods of mounting objects using the fixings.

10

### Background of the Invention

A variety of methods for hanging banners and display boards are known in the art. One approach secures the banner or display board on a surface, e.g. a wall, using  
15 nails or hooks, the banner being suspended from the nails or hooks by a cord passing through holes or eyelets in the fabric of the banner or display board. However, this display system often appears untidy as the cord tends to sag between the fixing points and the nails or hooks mark  
20 the surface from which the object is suspended. In addition, mounting objects in this way is often difficult, requiring the person mounting the display to hold several things simultaneously.

It is also known to secure an object to a surface  
25 using aluminium extruded channel member having a mouth with inturned lips fixed to the surface. The object is secured to the channel using hexagonal- or square-headed bolts whose heads are slidably held in the channel member by the inturned lips, with their shafts protruding through the  
30 mouth of the channel. The shafts are passed through apertures in the object, allowing it to be secured to the channel using nuts. However, this approach requires that the bolts are inserted into an end of the channel and slid to the point on the channel at which the object is to be  
35 secured. This can be a problem where the channel is long, requiring the bolt to be slid a long distance, where it is difficult to gain access to the ends of the channel, or where the fittings used to secure the channel to the surface tend to obstruct the channel, making it difficult

to slide the bolts along it.

### Summary of the Invention

5 Broadly, the present invention provides a fixing for securing an object to a channel member having a mouth with inturned lips, the fixing comprising:

10 (a) a head portion adapted for insertion through the mouth of the channel when the fixing is in a first orientation, the fixing being rotatable into a second orientation in which the head portion engages internal surfaces of the inturned lips; and,

(b) a shank portion joined to the head portion, the shank portion being adapted to protrude from the channel.

15 In one preferred embodiment, the present invention provides a fixing for securing an object to a channel member, the channel member having a mouth restricted by inturned lips, the fixing comprising:

20 (a) a head portion having resilient arms, the head portion being adapted so that in a first orientation it can be inserted through the mouth of the channel and force applied to cause the arms to deflect against the channel, allowing the fixing to be rotated to a second orientation in which the arms are retained in the channel by the inturned lips; and,

25 (b) a shank portion joined to the head portion, the shank portion being adapted to protrude from the channel.

30 Thus, in use, the fixing is positioned in the channel by (1) inserting the head portion into the opening, (2) compressing the head portion by applying force to the shank portion protruding from the channel, (3) rotating the fixing while the head portion is in the compressed state, and (4) releasing the shank portion so that the head expands and engages the inturned lips of the channel. Preferably, when in position in the channel (i.e. inserted and rotated), the fixing is prevented from rotating, helping to avoid the head portion disengaging from the lips, and coming free.

35

Thus, the present invention provides a fixing that can be inserted at any point along the length of a channel member. This helps to avoid the problems that would be associated with using conventional hexagonal- or square-headed bolts to secure objects to channel members, which require that the bolts are inserted into an end of the channel and slid to the point on the channel at which the object is to be secured. In contrast, when using the fixings of the present invention, it is not necessary to slide the above fixings through long stretches of channel and it is not necessary to leave access to the ends when a channel is fixed in position, e.g. on a wall, when several channel members are fitted together to form a frame or when taking the channel member around corners.

In a preferred embodiment, the fixing has a pair of inwardly curving arms which can deflect towards each other on application of force in the first orientation and expand to engage or abut the inturned lips of the channel in the second orientation. The deflecting action of the arms can be achieved if at least a portion of them are made from a resilient material. Conveniently, the fixing is made from a plastics material such as nylon.

Preferably, the fixing further comprises a neck region located between the head portion and the shank portion, the neck region having faces which abut the channel mouth when the fixing is in the second orientation. The neck regions can help to stabilise the fixing in the channel mouth by increasing the area of contact between the fixing and the channel, helping to prevent the fixing moving in the channel, e.g. between insertion and securing the object. Preferably, the neck regions only allow the fixing to be rotated when the head is compressed.

In order to reduce wear on the neck region through contact with the mouth of the channel member, the channel mouth can be provided with faces, rather than edges to increase the area of contact with the neck portion. In However, in this event, it is generally desirable to reduce

the thickness of the channel wall to the minimum compatible with the strength requirements, in order to reduce manufacturing costs. Thus, while the walls of such channels will tend to be thin, channel members may be provided for use with fixings having a deep neck, the channel members having inturned lips of a greater thickness than the other walls of the channel, thereby providing a greater area of contact between the neck and the channel mouth. Alternatively, the thick part of the lip may be confined to a ridge running adjacent the channel opening.

In alternative embodiments, the fixing is not provided with a neck region. In this case, preferably the resilient arms provide sufficient force when the fixing is in the second orientation to retain the fixing in place in the channel.

The depth of the (uncompressed) head may be slightly less than the internal depth of the channel, so that after fitting the fixing into the channel, it may easily be positioned. Alternatively, the depth might be slightly greater than the internal depth of the channel, so that when the compression is released the fixing is held firmly in place in the channel.

Channel members are commonly fixed to surfaces (e.g. a wall or ceiling) by screws. This is usually done by inserting the screw through the opening in the "front" of the channel and screwing into the surface through the opposite "back" wall of the channel. It is desirable that fixings can slide along the channel without fouling the heads of the screws (or other fixing) used to fix the channel to the surface. This can be achieved by providing the head portion with a slot or a gap so that the head portion can slide over protruding channel fixings. The latter feature may be particularly advantageously combined with a compressible head and a neck region, so that the orientation of the gap in the head does not change as the fixing moves in the channel.

Alternatively, the channel fixings can be countersunk

into the channel or the channel designed to have an internal depth sufficient to allow the bolt to pass the protruding heads.

5 The shank portion may in principle be of any shape, according to the desired function. Various shapes may be suitable for the mounting of displays, e.g. hook, knob, ring, shelf or clip. However, the shank portion is advantageously a threaded shaft, which in use co-operates with corresponding nuts to secure objects to the fixing.

10 In this embodiment, preferably only the threaded shaft protruding from the channel mouth when the fixing is in the second orientation. This helps to ensure that when a nut is fitted to the threaded shaft, the nut comes into contact with and is tightened against the exterior of the channel,

15 allowing the fixing to be securely held in position. The same principle may also apply if an object is positioned between the nut and the channel. If an unthreaded part of the shank or the neck protrudes from the opening, it may prevent contact between the nut (or object) and the

20 exterior surface of the channel and therefore prevent the fixing from being securely fixed in position.

Preferably, the fixings can be made of a plastics materials (e.g. nylon). However, they may in principle be made of any material or combination of materials. Parts of

25 the fixing (e.g. the surfaces of the head which engage the inturned lips and if present the surfaces of the neck which co-operate with the edges of the lips and/or screw thread) may advantageously be of a stronger material, e.g. steel or aluminium.

30 The fixings described herein may be used to secure a wide variety of objects to channel members, e.g. display items such as banners, posters, whiteboards and signs; boxes such as collecting boxes, bins and leaflet dispensers; and brackets for connecting channel members to

35 surfaces (e.g. to make frames out of channel members) or to each other.

In a further aspect, the present invention provides a

fixing in combination with securing means engagable with the shank portion. In embodiment in which the shank portion has a threaded shaft, the securing means are a cooperating nut.

5           In a further aspect, the present invention provides one or more of the fixings and securing means, together with a length of channel having inturned lips and/or an object for securing to a surface.

10           In a further aspect, the present invention provides a system for constructing a sign display comprising:

(a) one or more channel members, each channel member having a mouth with inturned lips;

15           (b) one of more of the above fixings in combination with securing means engagable with the shank portions of the fixings;

(c) one or more brackets, each bracket being apertured to receive the shank portions of the fixings; and,

20           (d) one or more panels, the panels being apertured for securing to channel members;

wherein the channel members and the brackets are connectable using the fixings to assemble a frame and the panels can be secured on the frame using the fixings, the shank portions of the fixings extending through the apertures in the panels and being secured by the securing means.

25           In some embodiments, the system can be used to construct a planar sign attached to a surface such as a wall. Alternatively, a three dimensional frame can be assembled using the system, e.g. in the form of a square pillar, and sign or display panels attached to the sides of the pillar.

30           In a further aspect, the present invention provides a method of mounting a banner on a surface using a kit as described above.

35           An embodiment of the present invention will now be described by way of example only, with reference to the

accompanying drawings, in which:

Figure 1 shows a perspective view of a fixing;

Figure 2 shows an end view along the axis of the fixing, from a shank portion to a head portion;

5        Figure 3 shows a cross-section of a channel having inturned lips, the head portion of the fixing being inserted in a first orientation into said channel;

10        Figure 4 shows the fixing in a second orientation in the channel, fully fitted, with the head portion of the fixing underlying the inturned lips of the channel, and the head portion clearing a screw head protruding into the channel;

15        Figure 5 shows a banner slidably secured by a nut onto the fitted fixing, the nut being covered by a decorative cap;

Figure 6 shows how channel members can be connected together using brackets and the fixings; and,

20        Figure 7 shows a framework for mounting sign or display panels constructed using a system comprising the fixings.

#### Detailed Description

25        Referring to the drawings, figures 1 and 2 show a fixing 2 formed as a solid nylon moulding, the fixing comprising a head portion 4, a neck portion 6 and a shank portion 8.

30        The shank 8 is essentially cylindrical, with a screw thread 10 running helically around the curved surface along its entire length.

35        The neck portion 6 is located between the shank 8 and the head portion 4. The neck portion has a generally square cross-section, and is provided with four narrow, rectangular faces 13, 14, which are perpendicular to each other.

40        Continuous with the end of the neck portion 6 furthest from the shank is the head portion 4, which comprises two resilient arms 16. The arms are thickened in the region of

attachment to the neck portion 6, but taper away from the neck portion. The length of each arm is roughly twice its width. In the embodiment shown in the drawings, the arms extend outwards from the neck portion in opposite  
5 directions, perpendicular to the axis of the shank and neck portion, with edges 20 of the arms flush with the other two faces 13 of the neck portion. Accordingly, the fixing is generally T-shaped, the upright of the T-shape being the shank and the top being formed by the arms.

10 The arms 16 are inwardly curving, having an acute bend about halfway along their length so that the free ends 22 of the arms overlie the attached ends. In the uncompressed state, the angle of the bend is around  $60^\circ$ . However, the arms are resilient so that the free ends 22 may be pushed  
15 inwardly, thereby compressing (i.e. reducing the depth of) the head portion 4. When the deforming force is removed, the arms restore to their natural state. In contrast to the free ends 22 of the arms, near the neck portion the arms are thicker and more rigid, and so deform little. As  
20 the distance between the bends and the free ends of the arms is slightly less than half the span, the free ends do not come into contact on compression.

The fixing 2 may be inserted into a channel member 30 having a mouth restricted by inturned lips 36, see figures  
25 3 and 4. The width of the mouth 32 of the channel is slightly larger than the width of the arms, but considerably less than the span between the arms. Insertion is performed in the following manner:

1. The fixing is held by the shank 8 and the head  
30 portion 4 is pushed through the mouth 32 of the channel. This is possible only if the fixing is oriented so that the arms extend along the length of the channel opening (the "first orientation"). This is shown in figure 3, in which the arms extend into and out of the plane of the drawing.  
35 The fixing and channel are sized so that when the fixing is in this orientation, and the arms have not been deflected against the back wall 34 of the channel, the neck portion

is located between the inturned lips 36. Consequently, the fixing may not be rotated.

2. The shank 8 is next pushed further into the channel in the direction shown by the arrow in figure 3. This deflects the arms 16 against the back wall 34 of the channel, compressing the head portion 4. With the arms in the deformed state, the neck portion 6 of the fixing is wholly within the channel, rather than in the opening 32 between the lips 36.

3. The shank 8 is then twisted about its axis so that the fixing is rotated by approximately 90°. The arms are thus brought into a second orientation, in which the span of the arms is perpendicular to the opening 32 of the channel and in which the arms underlie the lips 36.

4. The force on the shank 8 is released. The arms 16 are resilient and therefore return to their natural state, bringing the surface 18 of each arm into contact with the interior surface 38 of a lip 36. This arrangement is shown in figure 4.

In some embodiments, the length of the neck portion is less than the thickness of the inturned lip, so that when the fixing is inserted and the arms are in contact with the interior surfaces of the lips, the neck portion does not protrude from the opening. In the figures, the channel member 30 is thickened in this region by means of a ridge 40 running along the interior surface of the lip, adjacent to the opening, to increase the area of contact between the neck portion and the lips, and reduce wear.

When the fixing is fully fitted (in the second orientation with no force applied to the shank), the arms are not pressed firmly against both the lips 36 and the back wall 34 of the channel (though of course the fixing could be arranged to do this). The fixing may therefore easily be slid along the channel into the exact desired position. The free ends of the arms do not impinge on the region immediately opposite the channel opening and the fixing may therefore avoid fouling (e.g.) protruding screw

heads when sliding along the channel. Figure 4 shows the fixing overlying, but not fouling, a protruding screw head 42. Additionally, there is a central recess in the head portion, between the thick parts of the arms, which further  
5 aids the avoidance of obstructions in the channel.

To attach an object to the channel member, the shank of a fitted fixing 2 is passed through the object, and a nut 52 is screwed on the thread 12. It may of course also be possible to attach the object first, before fitting the  
10 fixing in the channel. If it is desired to fix the object firmly in position, the nut is tightened, bringing the nut, object, channel lip and arms of the fixing tightly into contact. The fixed object can be readily slid along the channel, if the nut is screwed on, but not tightened.

15 A decorative cap 54 may be fitted on the nut 52. A hole 56 is provided in the cap which mates closely with the nut. If suitably shaped, similar caps may be provided for tightening the nut on the shank of the fixing.

The assembly shown in figure 5 comprises a channel  
20 member 30, fitted with a fixing 2 (as shown in figure 4), the shank of which has been inserted through an eyelet 62 of a banner 60 and slidably secured with a nut 52. A decorative cap 54 has been fitted on to the nut.

Figure 6 shows how channel members 30 and right angled  
25 brackets 64 can be connected together using the fixings 2 and nuts 52. The fixings 2 are retained in the channels 30 by the inturned lips 36, with their shanks passing through apertures 66 in the brackets. The brackets and channel members are then held together by fitting nuts to the  
30 shanks. Figure 7 shows how this system can be used to construct a framework 68 that can be used to mount sign or display panels. As well as being used in the framework, the fixings can also be used to secure the panels to the  
35 framework.

CLAIMS:

1. A fixing for securing an object to a channel member, the channel member having a mouth restricted by inturned lips, the fixing comprising:

(a) a head portion having resilient arms, the head portion being adapted so that in a first orientation it can be inserted through the mouth of the channel and force applied to cause the arms to deflect against the channel, allowing the fixing to be rotated to a second orientation in which the arms are retained in the channel by the inturned lips; and,

(b) a shank portion joined to the head portion, the shank portion being adapted to protrude from the channel.

2. The fixing of claim 1 wherein the fixing has a pair of inwardly curving arms which can deflect towards each other on application of force in the first orientation and are retained by the inturned lips of the channel in the second orientation.

3. The fixing of claim 1 or claim 2 further comprising a neck region located between the head portion and the shank portion, the neck region having faces which abut the channel mouth when the fixing is in the second orientation.

4. The fixing of any one of claim 1 to 3 wherein the head portion is provided with a slot or gap so that the fixing can slide over obstructions within the channel.

5. The fixing of claim 1 wherein the shank portion has a threaded shaft for engagement with a nut.

6. The fixing of claim 5 wherein the nut is provided with a cap.

7. The fixing of any one of the preceding claims wherein

the fixing is made from plastic.

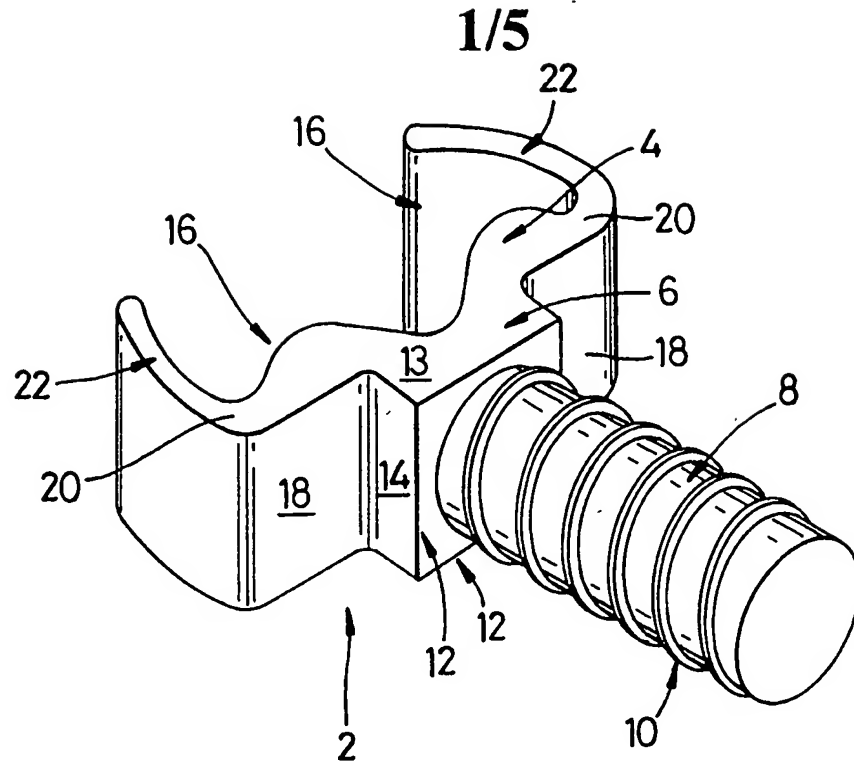
8. A kit comprising a fixing of any one of claims 1 to 7 in combination with securing means engagable with the shank portion of the fixing and a length of channel having inturned lips and/or an object for securing to a surface.

9. A system for constructing a sign display comprising:  
(a) one or more channel members, each channel member having a mouth with inturned lips;  
(b) one or more fixings of any one of claim 1 to 7 in combination with securing means engagable with the shank portions of the fixings;  
(c) one or more brackets, each bracket being apertured to receive the shank portions of the fixings; and,  
(d) one or more panels, the panels being apertured for securing to channel members;  
wherein the channel members and the brackets are connectable using the fixings to assemble a frame and the panels can be secured on the frame using the fixings, the shank portions of the fixings extending through the apertures in the panels and being secured by the securing means.

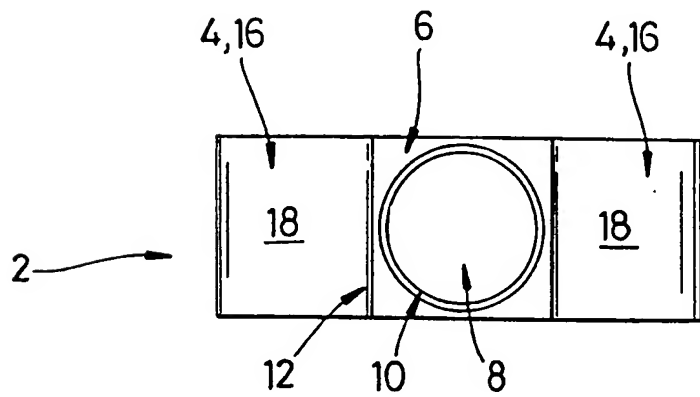
10. A method of mounting an object to a channel member using a fixing according to any one of claims 1 to 7, the channel member having a mouth restricted by inturned lips, the method comprising inserting the fixing into the channel member through the mouth of the channel, rotating the fixing so it is retained in the channel by the inturned lips, mounting the object on the shank of the fixing and securing the object on the shank using securing means engagable with the shank.

11. A method according to claim 10, wherein a plurality of said fixing members are used to mount the object.

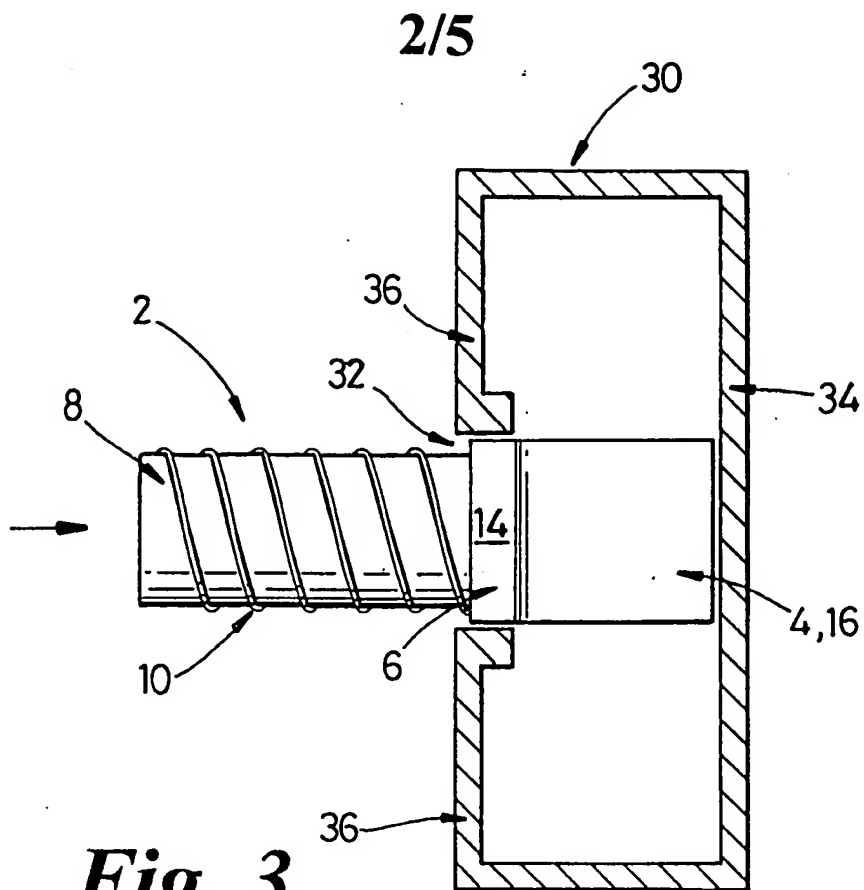
12. A method according to claim 10 or 11, wherein the object is a display item, box or bracket.



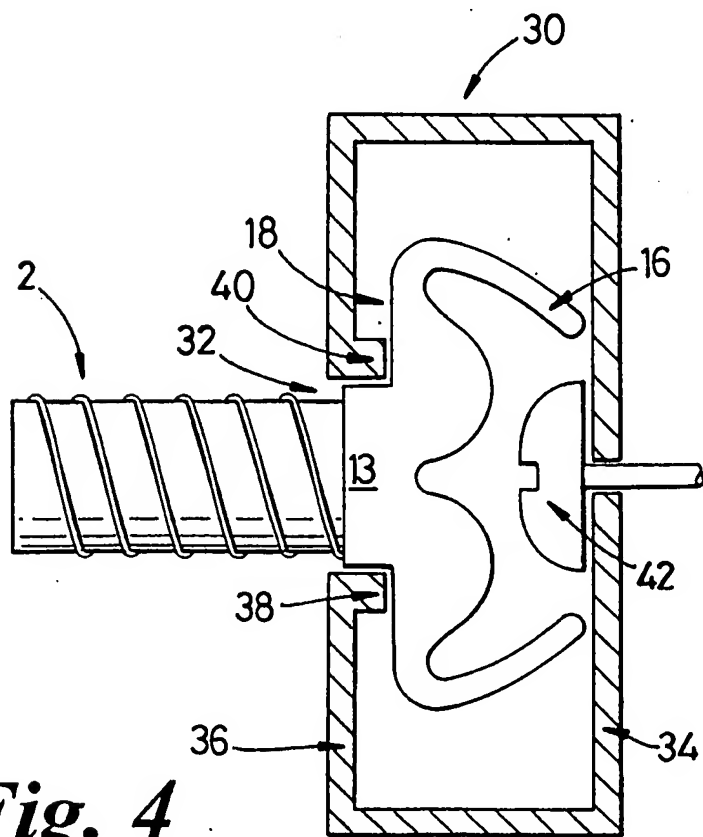
**Fig. 1**



**Fig. 2**

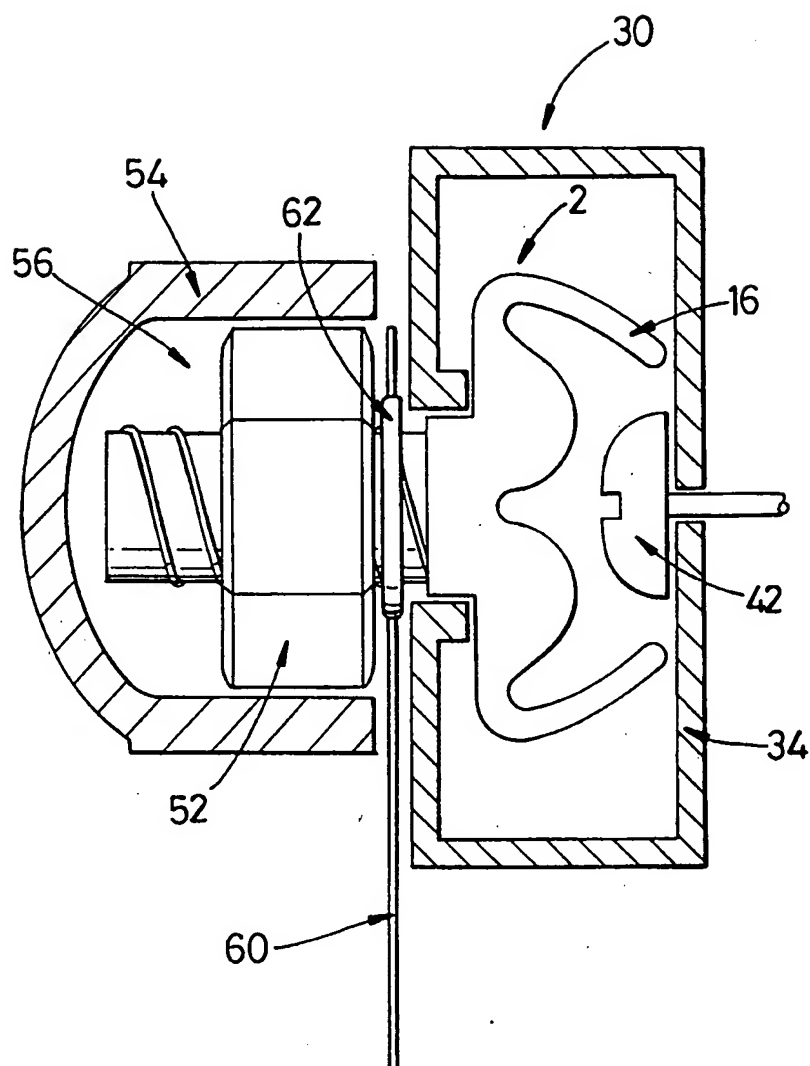


**Fig. 3**



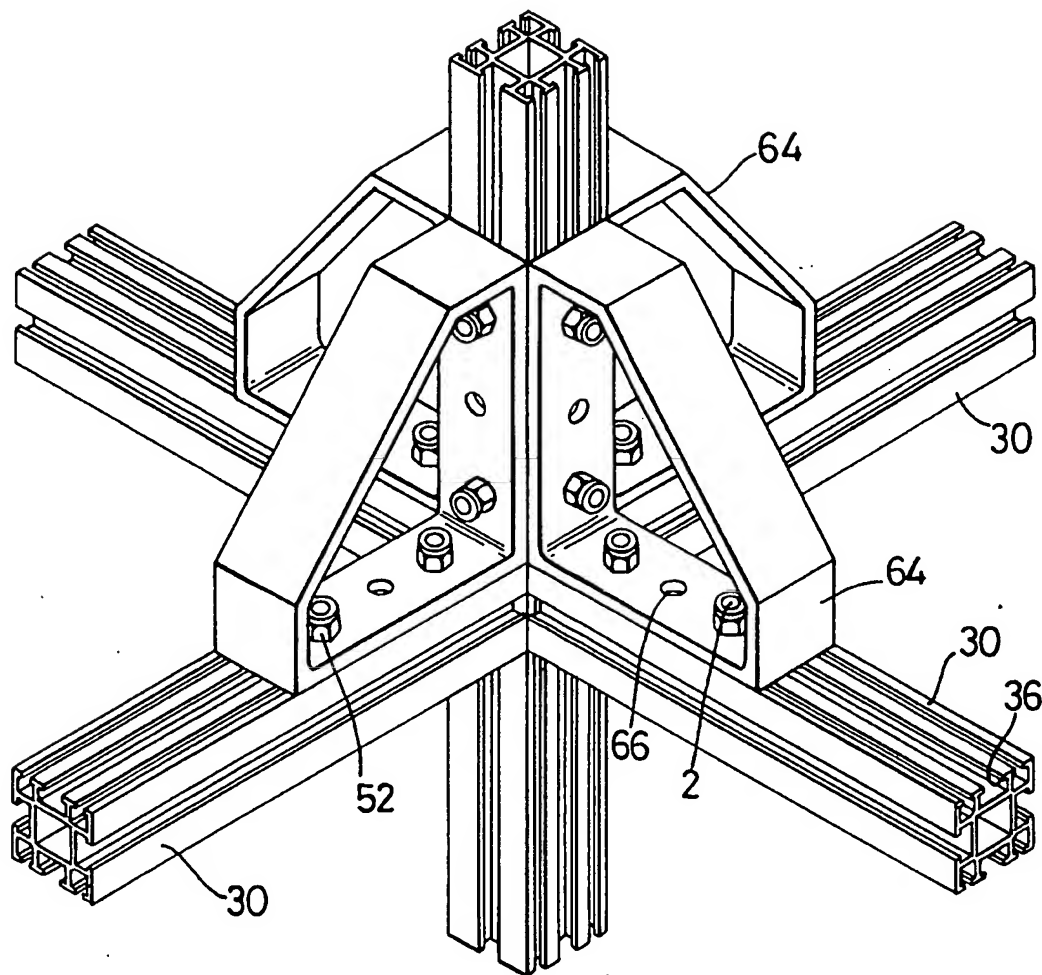
**Fig. 4**

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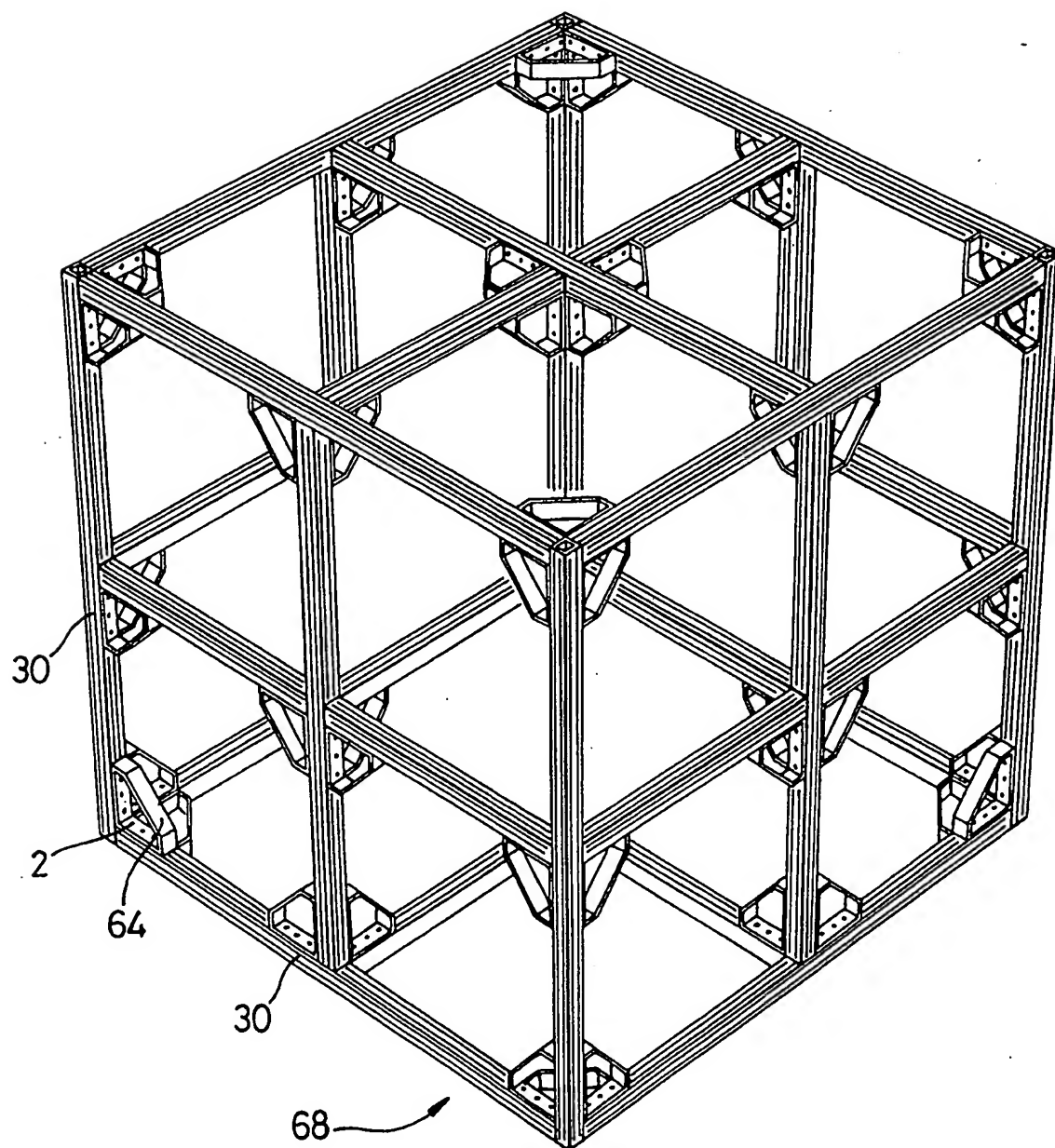
**Fig. 5**

4/5



*Fig. 6*

5/5



*Fig. 7*

# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/GB 98/00469

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 6 F16B37/04 F16B7/18

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y A	WO 94 10466 A (CHUDоба JOSEF ;KAUFELDT SVEN ERIK (SE)) 11 May 1994 see page 8, line 35-39; figures 3,5,6 ---	1-5, 10-12 6-9
Y A	US 4 315 393 A (SCHACK JAMES B ET AL) 16 February 1982 see column 3, line 63-68; claim 9; figures 2,3,5 ---	1-5,7, 10-12 6,8,9
Y A	FR 2 604 759 A (CAROSSINO ANDRE) 8 April 1988 see figure 4 ---	1-5,7, 10-12 6,8,9
Y A	US 4 741 582 A (PERONI PETER A) 3 May 1988 see the whole document ---	1,3 2-12
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☒ Further documents are listed in the continuation of box C.

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A	US 4 575 295 A (REBENTISCH HUGO E) 11 March 1986 see figures 4-16 -----	1-12

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Information on patent family members

Inter. Application No

PCT/GB 98/00469

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